OUR planet

Volume 10 Number 5 2000

UNEP

The United Nations Environment Programme magazine for environmentally sustainable development

BIOLOGICAL DIVERSITY

● Ted Turner
Critical crossroads

● Gordon Conway
GE crops: who benefits?

● Mohammed Valli Moosa
Sustainable solutions

● Richard E. Leakey
Protect and prosper

● Hanna Koch-Weser
Getting it together

● Raymond E. Kendall
Interpol alert

Win a pashmina shawl!

Contents

UNEP/Topham

Arthur Glaser/UNEP/Topham

Lee Wiese/UNEP/Topham

3 **Editorial**
Klaus Töpfer, Executive Director, UNEP

4 **Critical crossroads**
Ted Turner

6 **Genetically engineered crops: who benefits?**
Gordon Conway

9 **Sustainable solutions**
Mohammed Valli Moosa

11 **Protect elephants**
Richard E. Leakey

13 **Getting it together**
Maritta Koch-Weser

15 **CITES: 2000 and beyond**
Willem Wijnstekers

19 **Interpol alert**
Raymond E. Kendall

21 **Deep waters, high stakes**
Michael E. Huber

23 **Tall trees and bottom lines**
Thomas Lovejoy

25 **Globalizing solutions**
Mark Collins

28 **Walking on the wild side leaves heavy footprints**
Greg Neale

30 **Voices of the Earth**
Cultural and Spiritual Values of Biodiversity

32 **Millennium massacre**
Valmik Thapar

Our **Planet** is available on the **INTERNET** at: www.ourplanet.com

Our Planet, the magazine of the **United Nations Environment Programme** (UNEP).
PO Box 30552, Nairobi, Kenya.
Tel. (2542) 621 234; fax 623 927; telex 22068 UNEP KE;
e-mail: cpiinfo@unep.org

ISSN 1013-7394

UNEP Publisher/Director, UNEP Communication and Public Information: Tore J. Brevik
External Editor: Geoffrey Lean

A Banson production
Printed by Words and Publications, United Kingdom
Front cover: Carsten B. Hansen/UNEP/Topham

The contents of this magazine do not necessarily reflect the views or policies of UNEP or the editors, nor are they an official record. The designations employed and the presentation do not imply the expression of any opinion whatsoever on the part of UNEP concerning the legal status of any country, territory or city or its authority, or concerning the delimitation of its frontiers or boundaries.

The non-copyrighted contents of this magazine may be reprinted without charge provided that ***Our Planet*** and the author or photographer concerned are credited as the source and the editors are notified in writing and sent a voucher copy.

Our Planet welcomes articles, reviews, illustrations and photos for publication but cannot guarantee that they will be published. Unsolicited manuscripts, photographs and artwork will not be returned.

Subscriptions: If you wish to receive ***Our Planet*** on a regular basis and are not currently on the mailing list, please contact Mani Kebede, Circulation Manager, ***Our Planet***, for subscription details, giving your name and address and your preferred language (English, French or Spanish).

Change of address: please send your address label together with your new address to: Mani Kebede, Circulation Manager, ***Our Planet***.

This magazine is printed on paper made from 100 per cent recycled waste material. It is bleached without any damage to the environment.

Editorial

B. Wohlbier/UNEP

KLAUS TÖPFER
United Nations Under-Secretary General and Executive Director, UNEP

Some environmentalists are already asking: is the conservation battle lost? Is it too late to rescue more than a few pieces of the natural world that we inherited?

Even optimists like me recognize that the environment's passage through the coming century will be its most severe test. With human population expected to peak at 8 billion or more and the consumer revolution set for exponential expansion – leave alone the worsening stresses of climate change, ozone depletion and hazardous chemicals – species and ecosystems face profound risks. Unless we take extraordinary measures now nature will have been made simpler, duller and less productive by the 22nd century.

According to the *Global Biodiversity Assessment*, species extinction since the year 1600 has occurred at 50 to 100 times the average estimated natural rate. This is expected to rise to between 1,000 and 10,000 times the natural rate with, already, more than 31,000 species threatened with extinction.

This wave of extinctions and ecosystem destruction is an irreversible tragedy, but humanity's dependence on food crops and other biological resources also makes it dangerous. We do not want future generations to curse us for permanently impoverishing life on Earth.

Fortunately, we have tools at our disposal for granting the environment safe passage – committed groups and individuals, local and national programmes, and international treaties. The advantage of multilateral environmental agreements is that they enable us to think globally while empowering people to act locally.

The 1992 Convention on Biological Diversity (CBD) is one such ambitious international agreement. It is based upon our improved understanding of the interconnectedness and complexity of the natural world, and of the importance of this richness for human civilization. It is the first global, comprehensive agreement to address all aspects of biological diversity: genetic resources, species and ecosystems.

Recognizing that conservation alone could not secure the natural world's survival, and that development must rely on the use of natural resources, the Convention has also led the way in integrating environmental conservation with socio-economic development. Of particular far-reaching significance is the Convention's commitment to the fair and equitable sharing of benefits arising from the utilization of genetic resources.

Furthermore, the Convention's recently adopted Cartagena Protocol on Biosafety is the first global treaty that re-affirms, incorporates and operationalizes the precautionary approach affirmed in the Rio Declaration. The Protocol outlines procedures to deal with issues arising from the transboundary movement, transit, handling and use of genetically modified organisms – and commodities containing them – that may adversely affect the conservation and sustainable use of biological diversity or pose risks to human health and the environment.

Practical and targeted efforts to preserve and sustainably use biodiversity are also taking place under other agreements. Some, such as the 1979 Bonn Convention on Migratory Species (CMS) and the 1973 Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) (whose secretariats, like CBD's, are administered by UNEP), focus on species. Others, such as the 1971 Ramsar Convention on Wetlands of International Importance, deal with ecosystems. Several regional seas agreements, such as the Abidjan, Barcelona, Cartagena, and Lima Conventions, have protocols on special protected areas and wildlife. Taken together, this canon of conventions protects many of the world's most endangered species and natural systems.

CITES is a highly developed and specialized tool for saving at-risk species – today covering 35,000 plants and 4,000 animals. It enables governments either strictly to regulate international trade (with an Appendix II listing) or to ban all international commercial trade (via inclusion in Appendix I) in species threatened with extinction. The fact that many commercially valuable species are being harvested at unsustainable rates increases the need for managed trade regimes that can promote a balanced relationship between people and the natural world. Despite its strong focus on conservation, then, CITES is truly an instrument for sustainable development.

The CMS offers strict protection to endangered species that migrate across political borders. It also seeks a coordinated conservation approach by promoting regional agreements amongst states along migration routes. Such agreements can include habitat conservation, capacity building and training, harmonized national legislation, coordinated research and monitoring, and public awareness campaigns.

These treaties share one common aim: the conservation and sustainable use of biological diversity and its components. This will be more readily achieved through stronger collaboration among the various agreements, a goal that UNEP is strongly promoting.

We have the tools for guiding the natural environment carefully through the coming decades. Let's use them! ■

Ronald Wilson/UNEP/Topham

Critical CROSSROADS

TED TURNER calls for an urgent change in attitude towards biodiversity and describes what his foundations are doing to help bring it about

Modern human society is systematically wiping out life on Earth. This may sound alarmist, but it is true.

Our best scientists now predict that up to two-thirds of all species may be exterminated by the end of this century. If this forecast bears out, many of the animals and plants that comprise the unique natural heritage of communities and countries around the world will disappear. In their place will be a smattering of opportunistic and globally adaptable creatures that thrive in disturbed environments. In other words, envision a world where cockroaches, rats and pigeons take over from butterflies, tigers and parrots.

This epidemic of extinction is one of the foremost crises facing our society, and it threatens to leave the human race with a greatly impoverished planet. Yet, despite the magnitude of the problem, public pressure to act and political will to change the *status quo* are sorely lacking. Why? We need to do a better job at calculating and articulating the value of biodiversity and at finding innovative ways for biodiversity to 'earn its keep'.

While the scientific and moral arguments for protecting biodiversity are cogent, they are not enough to win the day. The general public usually does not argue with the abstract value of protecting species and preserving habitat, but it will not be spurred to action until the case is made strongly and repeatedly that it is in everyone's best interest to preserve biodiversity, even in the face of a world plagued by poverty.

Traditionally, the avenue for attaining wealth has been plundering natural resources, and the history of the United States of America is a telling example. We have chopped down 93 per cent of our old growth forests, ploughed under 98 per cent of our native prairies, and filled in more than 50 per cent of our wetlands. For this, we are now suffering the consequences. A host of species dependent upon these systems are now extinct or endangered, and we wrestle daily with the challenges of poor air quality, urban sprawl and overdevelopment. Our current challenge, therefore, is to promote a new development paradigm where the preservation and restoration of biodiversity becomes a credible alternative to its destruction.

We need to do a better job at calculating and articulating the value of biodiversity

This is not only doable, it is being done. For example, the Turner Endangered Species Fund (TESF), a United States-based non-governmental organization, is working to conserve biodiversity by ensuring the persistence of imperilled species and their habitats. In the process, TESF is working to promote a new way of valuing the land – one not measured in metres or hectares planted, but rather in functioning natural ecosystems and flourishing native flora and fauna. Moreover, TESF projects illustrate that private landowners can substantially contribute to the conservation of nature and still benefit financially.

Conservation measures

At the global level, biodiversity is a core priority of the United Nations Foundation (UNF), a public charity established to support the United Nations and its causes. UNF is using its resources to try to increase the benefits that developing countries will reap by taking measures to conserve their flora and fauna. One specific UNF emphasis is on World Heritage Sites, which are nominated by the nations where they are located and recognized by the United Nations for their 'outstanding universal value'.

These places, which include the United Republic of Tanzania's Serengeti National Park, Ecuador's Galapagos Islands, and India's Manas Wildlife Sanctuary, contain some of the most important and significant natural habitats in the world for conserving biodiversity. If these great places are to endure, the challenge is to help countries realize benefits from protecting them, from the local level on up. In this vein, UNF has funded an initiative with the United Nations Development Programme and the Small Grants Program of the Global Environment Facility (GEF) to support the development of economic alternatives for communities surrounding World Heritage Sites. The project seeks to promote innovative ways for people living near these sites to benefit from their presence in such a way that does not harm and even enhances conservation objectives.

Benefits need not solely be economic. In an increasingly homogenous world, a country's natural heritage is one of a diminishing set of truly unique attributes and, as such, should be a unifying force for national identity and pride. As UNF further develops its programmes, it will be looking for opportunities to use World Heritage Sites as vehicles for raising national awareness about biodiversity and the importance of protecting it.

Long-term investment

One UNF project that is worthy of note is in Suriname, where the Government has taken a bold step to protect a vast area of undisturbed tropical forest. The recently designated Central Suriname Nature Reserve, which has been nominated for World Heritage status, comprises about 10 per cent of Suriname's entire land area. Rather than opting to liquidate this resource for timber extraction, Suriname has instead decided to make a long-term investment in the trees, rivers, birds and animals it contains. UNF, along with Conservation International, the GEF and others, has established a trust fund to provide ongoing revenue for the Reserve's management. This is a first step toward delivering to Suriname a return on its investment.

Lynn G. Hodges/UNEP/Topham

The real hope down the road, however, is that Suriname and others who similarly invest in protecting and restoring nature's wealth will benefit in far larger ways. What might the carbon locked up in these pristine forests be worth one day? How great will the tourist demand be for unspoiled, wild places, as our population grows and we become increasingly urbanized? How important will intact watersheds be for maintaining water quality and quantity for the world's people? One can only speculate.

We are now at a critical crossroads. We can sit back, accept the *status quo* and watch as dire scientific predictions become reality. Or we can work together systematically and urgently toward realizing a future where civilization values vibrant ecosystems and healthy wildlife populations as highly as skyscrapers and superhighways. Once we recognize that biodiversity loss is an impediment to human development – and not its natural consequence – we will be able to tackle this crisis head on ■

Ted Turner is Vice Chairman of Time-Warner Inc. and founder of CNN.

Genetically engineered crops: **who benefits?**

GORDON CONWAY explains why genetically engineered crops have become controversial and describes how, with a change of focus, they could help achieve a new Green Revolution

The debate over genetically engineered crops has generated much heat, and very little light or wisdom. It has been particularly impassioned in Europe. That is not surprising. The Europeans are very wary of governments and scientists telling them not to worry. They remember the 'Mad Cow' experience all too well.

European, and for that matter Ainerican, consumers have seen few benefits from genetically engineered crops. American farmers (and the biotechnology companies) have been the primary beneficiaries. *Bt* corn (which produces a bacterial-based insecticide) is very effective against the European cornborer that caused a billion dollars worth of damage in 1997. And herbicide resistant soybean is profitable in weed control, especially for farmers following no-till rotations to improve soil conservation.

Many farmers have made significant profits. That is why they have been so keen to buy the new seeds. Worldwide, over 40 million hectares were planted to genetically engineered crops in 1999. In the United States of America these varieties accounted for half the soybean and cotton and a third of the corn (maize) hectarage.

A fine line

But, alongside the lack of benefits to consumers, there are also risks, some real and some imaginary. In practice, it is difficult to draw a distinct line between 'traditional' plant breeding techniques (through which we have been redesigning nature for thousands of years) and genetic engineering. But the capacity of genetic engineering to move genes across genera and families, and between animals and plants, may give rise to unanticipated interactions. We need to move cautiously.

The transferred genes may escape from cultivated crops into wild relatives (or to organic varieties on nearby farms). This is a justified concern. Genes from existing commercial crops can and do pass to organic crops, and *vice versa*, and genes from both transfer to wild relatives. Even self-pollinated crops, such as rice, will cross with wild rices. Such risks may be higher in developing countries, since wild relatives are often common. But the key question is whether genes remain in the wild relatives and whether this results in adverse ecological effects, such as the production of 'super-weeds'. Only extensive, well-designed and monitored field tests will give us the answers.

Another significant risk – the potential for pests to evolve resistance to the toxins produced by *Bt* genes – is well known. Setting aside non-*Bt* areas as refuges is one answer. Nevertheless we will need to anticipate the eventual breakdown of control.

Bt is regarded as a safe insecticide, since it mostly kills pest caterpillars, leaving beneficial insects unharmed (and for this reason is often used as a key pesticide by organic farmers). Recently, in a much publicized experiment, pollen from *Bt* corn was shown to kill caterpillars of the Monarch butterfly. It was not a surprising result. The *Bt* toxin kills most caterpillars, not just the European cornborer. But in the field, concentrations of corn pollen fall away very rapidly from the edge of the crop. Beyond 3 metres the pollen load on neighbouring milkweed plants – the natural food of the Monarch caterpillar – will be safe for the caterpillars.

Wherever *Bt* cotton has been grown – in the United States of America and China – there has been a significant reduction in insecticide use. Pesticide poisoning has become less common and butterflies and birds have returned to the environment.

The most serious health risk is that transferred genes may increase allergies, through the introduction of new proteins to foodstuffs. Allergies can be tested for, where known, but there may be surprises.

Other fears have less scientific basis.

We need a new revolution – a Doubly Green Revolution

T. Riverson/UNEP/Topham

Chen Yiping/UNEP/Topham

There is no reason to suppose that the process of gene transfer confers a health risk. Neither is there any *a priori* reason why ingesting pieces of transgenic DNA is likely to be hazardous, any more than the large quantities of DNA from numerous sources ingested every day in normal diets.

But, on balance, many European and some American consumers feel the risks outweigh the benefits.

For the developing countries the balance may turn out to be rather different. It is clear that they urgently need more food – some 800 million people in the world are chronically undernourished and some 180 million children are severely underweight for their age. Many die as a result.

By the year 2020 there will be an extra 1.5 billion to feed. That is a tall order; a challenge as great as that which faced the Green Revolution 30 years ago. Some argue it is simply a problem of unequal distribution. If poor people were not poor they could buy the food they need. This is true, but oversimplistic and not very helpful. There are no signs that the world is about to engage in a massive redistribution of wealth.

Food where it's needed

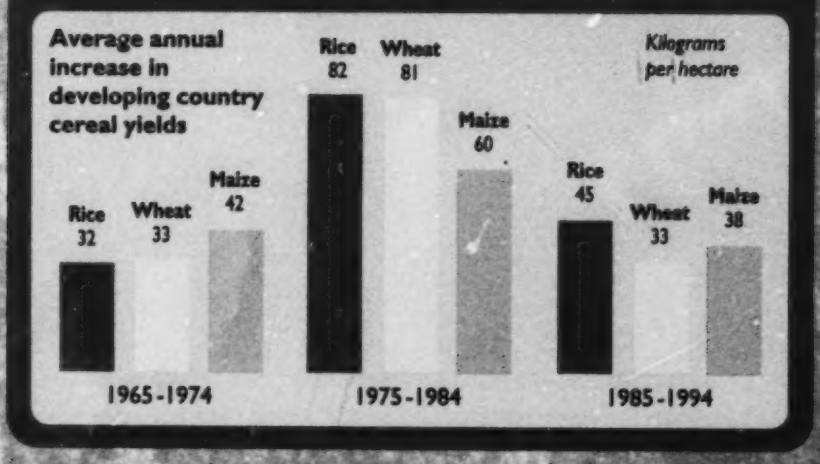
Providing several hundred million tonnes of food aid would be very costly, not least in its impact on the environments of the industrialized countries. It would also inhibit local farmers from producing for the market. And the practical reality is that the majority of the poor live in rural areas. However one looks at it, the answer has to lie in greater agricultural and food production in the developing countries.

That is not going to be easy. In the early years of the Green Revolution the yields of the major cereals (rice, maize and wheat) were increasing at about 40 kilograms (kg) per hectare per year. At the peak, the rate was 60-80 kg, but in the recent decade it has gone down again, to about 40 kg (see page 8).

I believe we need a new revolution – a Doubly Green Revolution that repeats the successes of the old but in a manner that is environmentally friendly and much more equitable. This means applying modern ecology to the development of sustainable agricultural systems. But it is also going to need the application of modern biotechnology – to help raise the yield ceiling, to produce crops resistant to drought, salinity, pests and diseases, and to produce new crop products of greater nutritional value. ▶

Raj Chetti Chetty/UNEP/Topham

Alain Compost/UNEP/Topham



Significant progress is being made. Chinese scientists, with funding from the Rockefeller Foundation, have produced a new rice variety using tissue culture, called La Fen Rockefeller, that is providing farmers in the Shanghai region with 15 to 25 per cent increases in yield. Scientists in West Africa have also used this technique to cross the high yielding Asian rices with the traditional African rices. The result is a new plant type that looks like African rice during its early stages of growth (in particular, it is able to shade out weeds) but becomes more like Asian rice as it reaches maturity, resulting in higher yields with few inputs.

But, the most significant achievement has been the introduction of genes that produce beta-carotene – the precursor of vitamin A – in the rice grain. Beta-carotene is present in the leaves of the rice plant, but conventional plant breeding has been unable to put it into the grain. Dr. Ingo Potrykus of the Swiss Institute of Plant Sciences in Zurich, who carried out the work with Rockefeller and Swiss Government funding, transferred one bacterial gene and two daffodil genes. The transgenic rice grain has a light golden-yellow colour and contains sufficient beta-carotene to meet human vitamin A requirements from rice alone. Over 100 million children suffer from vitamin A deficiency and 2 million die each year indirectly as a result.

Dr. Potrykus's team has also added a gene from the French bean to rice that increases its iron content over threefold. The number of women of childbearing age who are iron-deficient is over 400 million and anaemia is a major cause of death at childbirth.

Of course, before the new rices are released there have to be extensive trials. We have to examine potential risks. Are there any health hazards? In particular could allergies have been transferred? We need to know what effects the beta-carotene might have on insects that suck the grain.

There may be other concerns. Some may feel it is better, despite the cost and logistics, to provide children with vitamin A tablets. Others may believe it is desirable for children to get their vitamin A from homegrown leafy vegetables. I tend to agree with them, but realistically it is going to be many years before the poor farmers in the seasonally arid regions can grow vegetables throughout the year.

Building partnerships

But, to my mind, the most important question is: will those who really need the new technologies benefit? So far the big biotechnology companies such as Monsanto have focused on developed country markets where potential sales are large, patents are well protected and the risks are lower. The biotechnology companies are less interested in the good crops of small farmers in the developing countries.

Realistically, the public sector cannot and should not compete with the biotechnology companies. Somehow we have to build partnerships between them. One answer is for the private sector to market seeds for the commercial farmers, at the same time making genomic information and technologies available to the public sector for poor farmers. An important test of such an approach will be to persuade the various patent holders to donate to plant breeders in the developing countries the technologies used in producing vitamin A rice.

Professor Gordon Conway is President of the Rockefeller Foundation. His book, The Doubly Green Revolution: Food for All in the 21st Century, is published in paperback by Cornell University Press.

SUSTAINABLE SOLUTIONS

MOHAMMED VALLI MOOSA
puts the case for allowing a limited trade in ivory and elephants

Across the world there has been a competition between people and animals for land. In the developed world, animals lost this war centuries ago; but in the developing world the battle is not lost and we hold the hope of a solution that understands the close proximity in which we live.

We in the Republic of South Africa – like our neighbours in Namibia, Botswana and Zimbabwe – have had a measure of success in conserving the African elephant. The herds in the Kruger and Addo Elephant National Parks alone are currently growing at nearly 7 per cent and 5 per cent per annum respectively.

Now, at the 11th Conference of the Parties (COP) to the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), we propose transferring our African elephant population from Appendix I to Appendix II to allow the South African National Park to sell part of its stockpile of ivory and elephant hides, and allow for a limited trade in live elephants.

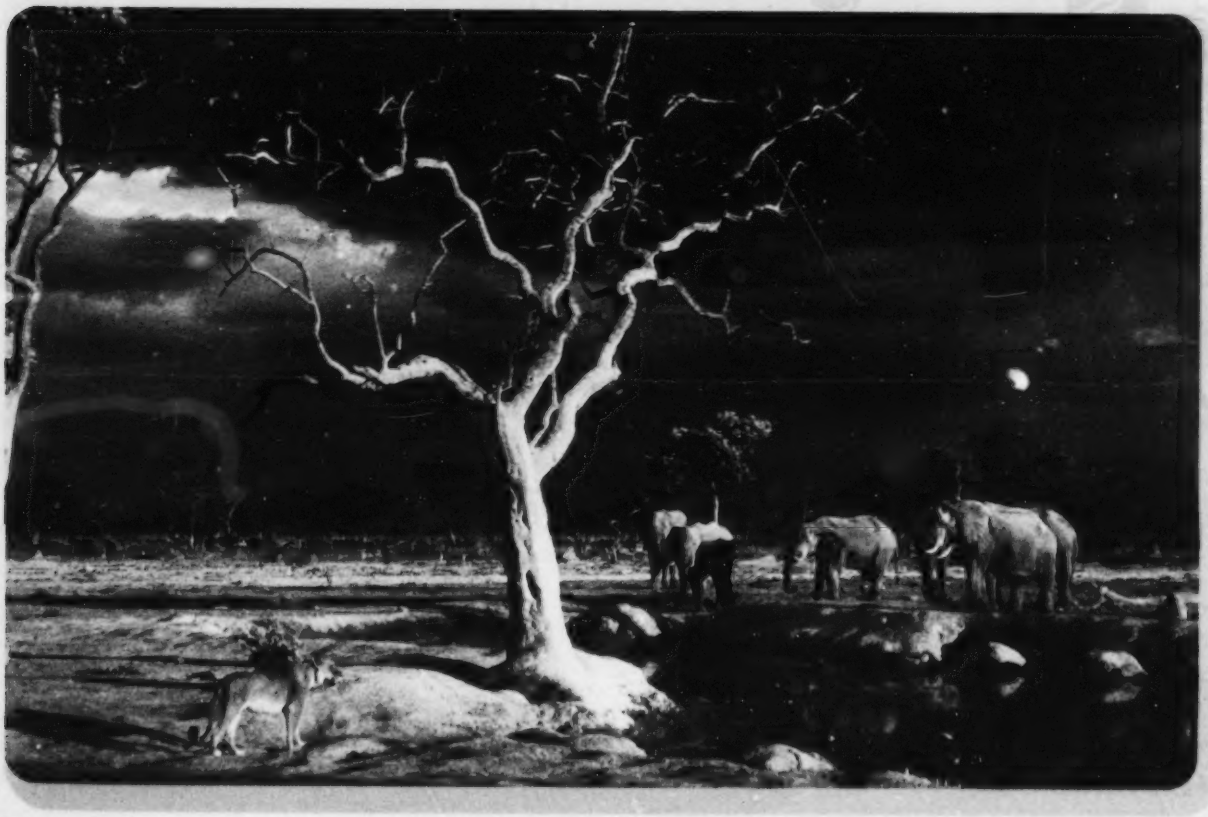
The South African proposal follows the provisions of Resolution Conference 10.10, that was adopted at the Harare COP of CITES in 1997 allowing Zimbabwe, Namibia and Botswana to sell specified amounts of raw ivory from their ivory stores that emanated from natural mortality or problem animal control.

Each of the successful sales late last year by our three neighbours was managed as a one-off deal to a single buyer and was scrutinized by CITES so that concerns, such as illegal ivory being slipped into the legal consignments, could be closely monitored.

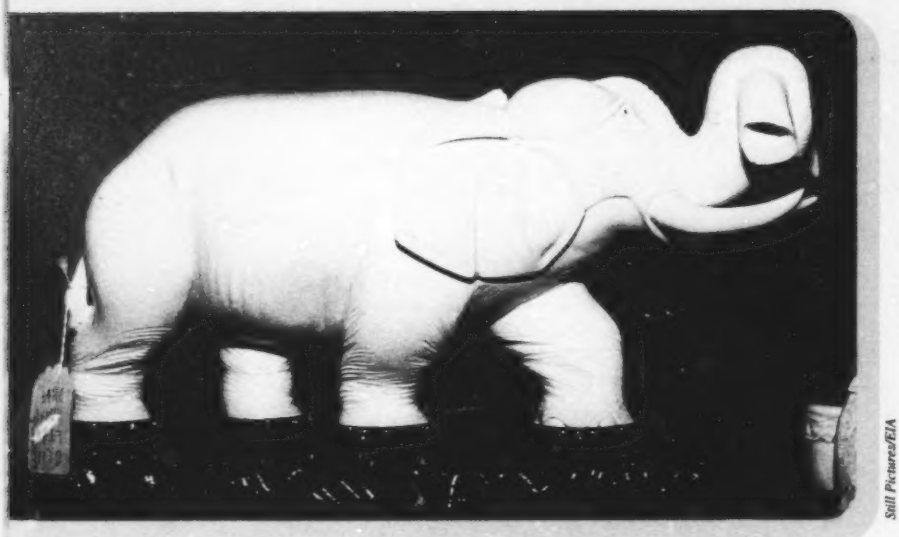
Cautious route

In its provisional assessments of the sales, the CITES Secretariat reported that 'one of the strongest aspects of the unprecedented trade control system adopted by COP10 in 1997 is exactly that only registered stocks of verifiable origin could be exported'. South Africa has followed these developments closely because we believe that the cautious route adopted at COP10 might provide us with a way to conserve our African elephant populations in a sustainable way.

Our elephant population is growing steadily to the extent that the growth in herds is starting to put strains on the biodiversity of some areas. According to 1999 surveys, the current elephant population of Kruger is 9,152 of our ▸



Gerald Hinde/UNEP/Topham



Still Pictures/EIA

approximately 12,000 African elephants in protected areas. Current estimates have established that the ideal population for Kruger is only 7,000.

Other avenues have been explored and over the past two decades 1,626 elephants have been translocated to other protected areas.

Our proposal to COP11 is an attempt to find a way to conserve our gains while at the same time gathering the financial resources that will allow us to manage our elephant populations more effectively and efficiently. Subject to strict conditions, the proposal to downlist is to allow for:

- Trade in the experimental quota of approximately 30 tonnes of whole tusks of government-owned stock originating from Kruger National Park.
- Export of live animals for re-introduction purposes into protected areas formally proclaimed in terms of legislation of the importing country only.
- Trade in hides and leather goods.
- Trade in hunting trophies for non-commercial purposes.
- And that all other specimens will be deemed to be part of the species in Appendix I and trade in them will be regulated accordingly.

Kruger currently has 32,113.24 kilograms (kg) of ivory and 152,099.90kg of hides in its stockpile. According to the inventory, the origin of 305.30 kg of the ivory is unknown, while 285.21kg were seized or confiscated, and therefore are not part of the proposal. Of the rest it is estimated that about 27,971.25 kg will be suitable for sale as some tusks are broken.

The majority of the stockpile (14,492.29kg) is from natural mortality. The total value of the elephant products in the stockpile at current prices is estimated at about R25.91 million.

If our proposal is accepted, the proceeds from the sale would be used for:

- The monitoring and research necessary to implement the new elephant management programme in the Kruger National Park. This programme will help to determine best practice in the management of elephant populations in protected areas.
- Increased monitoring and control of illegal hunting of elephants, especially intelligence networks.
- Creating protected areas sufficiently large for elephants to be re-established in parts of their former range (for example the proposed transfrontier area that will link Kruger with Gaza in Mozambique and Gonarezhou in Zimbabwe).

The best way to combat illegal trading is to undermine it through legal trade

We expect to face the opposition that was raised in Harare: that downlisting could lead to an increase in poaching and illegal trade. But the information available does not substantiate these fears.

MIKE, the system to monitor the illegal killing of elephants in the range states following COP10, has not picked up links between the Harare decision and an increase in illegal killing. Moreover, the anti-poaching measures that are in place in South Africa ensure that illegal hunting is not a problem.

Beyond bans

Our proposal is the search for a sustainable way in which we can continue to conserve the African elephant within effective systems of trade regulation and law enforcement.

The greatest threat to wildlife is habitat loss, and unless steps are taken to ensure that wildlife habitat is secure, no amount of trade bans will prevent a rapid increase in species losses in the new century.

Our colonial past not only alienated Africans from their land but also from wildlife and its rich economic and cultural heritage.

One of the contributing factors of the various poaching epidemics that have afflicted Africa in the past 30 years has been this lack of access to the wildlife resource.

CITES recognizes the beneficial effects of legal trade in a wide variety of species, and the assessments of the CITES Secretariat over the year are proof of this.

Let us not forget that illegal trading does continue to threaten our wildlife, but the best way to combat it is to undermine it through legal trade, and to address the equity issues that underpin wildlife protection. South Africa is proposing to sell a limited quantity of ivory and hides that will address both these issues ■

Mohammed Valli Moosa is Minister of Environmental Affairs and Tourism, Republic of South Africa.

Protect **elephants**

RICHARD E. LEAKEY argues that allowing any trade in ivory will increase the killing of elephants

Elephants and ivory are powerful ingredients in any contemporary debate about conservation. There are sound arguments from several perspectives and nobody anywhere suggests that elephants should be allowed to become extinct. Those who press the concept of sustainable utilization are as sure that theirs is the true path to the best future for elephants as are those who promote total protection and no management. Clearly it is more complex than this, and there is a vast number of considerations that must be taken into account.

The Kenyan position reflects a broad consensus that elephants should not be killed for the commercial use of their ivory. This position holds irrespective of whether the killing is legal or illegal: the purpose, if there is one, of the elephants' death should be quite separate from the prospect of using the death for financial gains. I make this distinction because I believe that the central issue for discussion should not be confined to trade or not to trade. Let us reflect upon the effects of trade in the context of the realities of conservation and wildlife management within the range of states of the world's remaining elephants.

Andrea M. Heine/UNEP/Topham

The patterns of human poverty and the related corruption of public officials in most elephant range states are directly relevant. Where an activity offers immediate financial gains realizable at relatively low risk, the control and sustainability of that activity is problematic to say the least, particularly where the activity takes place in the bush. The benefits to middlemen or links in the supply line are too attractive to be easily stopped by any authority operating within very limited budgets.

Serious doubts

If it were possible to maintain sufficient security on the ground in some countries to guarantee the safety of elephants, some progress would be made, but this alone would not be enough. The same elephant security would need to be extended throughout the range of the elephant so that the open, unguarded international or state borders would not be used to move ivory that was illegal. An additional factor that must be dealt with is the corruption of the officials who are charged with regulating exports. It is all too easy to obtain false documents or official documents that are deliberately falsified. Sadly this problem is not confined to the export end of the process, and similar corrupt practices are known to thrive in the importer countries. Can all of these loopholes be plugged? We in Kenya have experience that leads us to seriously doubt the veracity of claims that a trade in ivory at this time can be effectively monitored, leave alone sustainably managed.

There is an argument that we have all heard for many years which proposes ▸

M&C Denis-Huot/Still Pictures

The financial sacrifice of giving up ivory sales of which we hear so much is in fact negligible

that it is not fair to penalize nations that have a good record in conservation. The notion of anyone paying a penalty for being 'good' is surely a narrow, rather simplistic view. Is the reopening of trade and the probability that this has encouraged illegal killings of elephants fair to countries such as Kenya or India which happen also to be good conservationist nations? The point that I would make is to call for common action where the better-off help those who are less able. Surely this is a valid way forward. The financial sacrifice of giving up ivory sales of which we hear so much is in fact negligible if set against other items in any national budget. The loss of $3 million on revenue from ivory sales every few years seems a lot, but compare that to expenditures in the area of armaments and military hardware and it becomes trivial. If a government seriously wants to secure the survival of its elephants, the loss of revenues from suspending ivory sales is hardly an obstacle. Arguments that depend simply upon principle without reference to the reality of the actual situation are all too common, but I believe that they are at best disingenuous.

Diminishing resources

There is evidence that the number of elephants being killed for their ivory is on the increase. This upward trend in the data is not confined to one region: it appears to be true in southern, eastern, central and western African elephant range states. Economic data from all these areas point clearly to the diminishing public sector resources which are so essential to strengthening all the potential weak points in the system. It is not as simple as selling ivory in country 'X' to pay for conservation in that country. It is the customs service, the judiciary, the administration in that country and other countries that are providing the opportunities for an illicit trade in ivory.

Our concern in Kenya is not trade; our worry is the killing of elephants for that trade. If there is no trade anywhere, we believe there will be a dramatic decline in the number of elephants that are killed illegally. In time, probably long after our time, it would be good to be able to 'feel' ivory in one's grip as the commodity becomes available from natural deaths and specific control measures. Once we have evidence that elephants are not being killed for their ivory, nobody can seriously object to the commercial sale or trade of ivory. In Kenya, this is the position that we hope others will join ■

Dr. Richard E. Leakey, former Director of the Kenya Wildlife Service, is Secretary to the Cabinet and Head of the Public Service, Government of Kenya.

Getting it **together**

MARITTA KOCH-WESER talks to **Geoffrey Lean** about why conservationists have so far failed to get to grips with the extinction crisis, and outlines her plans for change

Maritta von Bieberstein Koch-Weser is the chief custodian of what she calls 'the saddest phone books on Earth'. The three thick volumes of the *Red Data Books*, compiled by IUCN–The World Conservation Union, where she is Director General, list over 40,000 species of animals and plants in danger of extinction.

'Despite the detailed research that has gone into compiling the books, they contain only a tiny fraction of the species being driven to oblivion around the world,' says Dr. Koch-Weser, an anthropologist and former senior official at the World Bank, who became head of the world's largest and longest-established conservation organization a year ago. 'We are losing species at up to 10,000 times the natural rate of extinction – more than was needed to wipe out the dinosaurs during the great extinction episode of 70 million years ago.'

And it is getting worse. 'Are we turning the corner? We are not. We continue to lose species faster than ever. There are a lot of people doing good work, and a lot of good laws. But it's just not coming together.'

Why not? One reason, she says, is that most conservation initiatives are individual projects, and do not bring about structural change. 'There are lots of good ones, but they are often recent, relatively small, and underfunded.' The establishment of parks and other protected areas are often 'one-off gestures of goodwill', with no real follow through.

Paper parks

'In all 9.6 per cent of the Earth is now under some declared form of protection. That is a lot of our one and only globe. But show me where is the system to maintain these as more than paper parks.

'Basically we do not have the same quality of thinking as in other sectors. In any infrastructure programme – even when people put in electric power lines – they think about operational maintenance in the long run. You don't have this in most environmental projects. You may find rhetoric; everybody has to say in their project justification that, after some international aid, the local government has signed on the dotted line that they are committed to something. But we are talking about long-term tasks.

'Environmental management does not involve huge investments up front. It takes small amounts of money and continuous sustained presence over long periods of time. But our systems of responsibility and funding don't work that way. Government budgets and administrative time frames are short term.'

Wasted resources

So it is not enough, she concludes, to blame a failure of political will for the accelerating loss of species. 'It is also the lack of a system. We don't have an operational ▸

Mike Kolloffel/Still Pictures

'The world is full of organizations doing good work'

and maintenance system for the environment. And without it we are putting money for protecting biodiversity into a black hole.'

At the same time, environmentalists need to get much more involved right at the other end of the process – at the earliest stage of planning developments. Instead of complaining about a dam, for example, once it has been approved, funded or built, they should be talking far sooner to the people who have to plan how to meet their countries' needs for energy and infrastructure.

'Normally there are different options and some are better than others,' she says. 'But if you come too late with your other options you miss the boat. Even organizations like the World Bank often come into the game too late, because banks are approached for funding when projects already exist. If we could get into so-called "upstream" dialogue with the people who drive investment – and thereby determine what happens on Earth – we could do a lot for long-term sustainable management of environmental resources. It is very important to get into discussions at this stage.'

IUCN has not done these things enough, she says, but is now putting this right. It is uniquely well placed because it brings together 76 governments, 104 government agencies, 755 non-governmental organizations and affiliates, and some 10,000 individual scientists and experts – and spans 181 countries. Dr. Koch-Weser comes fresh to the organization – from being the Bank's Director of Environmentally Sustainable Development for Latin America and the Caribbean – but has a long history of environmental commitment.

Life-long interest

This began, she recalls, in the early 1970s when she and her husband Caio, currently State Secretary in the German Finance Ministry, went as a young married couple to do research for their Ph.D.s together in Brazil. She studied Afro-Brazilian religious traditions, working in the poverty of the *favelas* for two years, while her husband concentrated on the effects of the vast infrastructure programme then being implemented by the country's military Government.

'We saw the beginnings of the Transamazon Highway. We went all over, in a little car, and we looked at the places where this infrastructure was being built. I learned a lot and got very involved. I became very interested in the social side of development planning and, very early on, in the environmental dimension.'

She taught at George Washington University and then in 1980 became one of the first anthropologists hired by the World Bank, becoming 'the kid' in a small, pioneering team of just two social scientists and 'three people who worried about the environment'.

'Out of that group grew the rules and framework that the World Bank set itself – and later its borrowers – on what constitutes reasonable environmental and social conduct. We also built up the first environmental lending programme and worked on the creation of special funds, like the Global Environment Facility.

'But a public bureaucracy, however dedicated, is obliged only to work with the public sector. In this uneven race we are in, where some of the runners are very big and fast and environmental action tends to be very underfunded and much slower, we have to operate at all levels. The power to do things more quickly now lies with civil society and the business community.'

So she is excited by the potential of IUCN's unique network, which combines the knowledge of the world's top scientists in the field, the authority and experience of all those governments and official bodies, and the flair and passion of a huge variety of pressure groups. She has spent the last year working out how it can be most effective, and will present proposals to the next IUCN Congress to be held in Amman, Jordan, this autumn.

Hitting the right note

'We need to reassess what we do as part of an orchestra. In 1948, when we began, there was nobody else: we played the only tune. Now the world is full of organizations doing good work: there is a large orchestra. What is our comparative advantage? What are the instruments we should play?'

One, she says, is continuing to deliver knowledge on species and what is happening to them through IUCN's expert commissions of top specialists. Another is to focus on governance, working out the practical measures that bring change: IUCN has already helped 75 countries to draw up environmental legislation and national biodiversity strategies. A third is to use the strength of its union of interests to push for international conventions to be agreed and implemented.

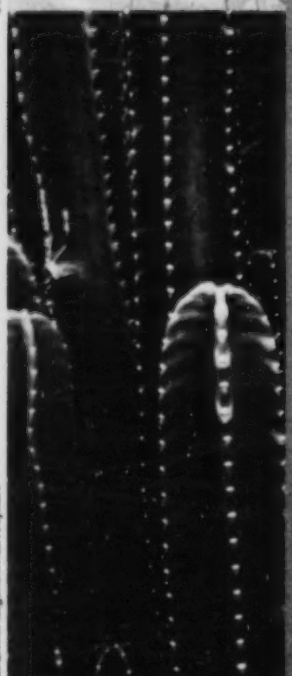
Yet another is to capitalize on the diversity of IUCN's network to provide a forum where the different actors can meet and thrash out solutions. This, she explains, can also help ensure that environmental interests are considered early enough in the planning process, and that projects are followed up with proper environmental management.

And the chances of success? 'They have to be good. There is no alternative. If we do not succeed the future will be bleak. But if they are to be good, we in the environmental community will have to become much more proactive.' ■

CITES: 2000 AND BEYOND

UNEP

Uwe Walz/UNEP/Topham



Elizabeth Lagoon/UNEP/Topham

Sol B. Lacayo/UNEP/Topham

Clearly, the April meeting of the Conference of the Parties to the Convention on International Trade in Endangered Species of Wild Fauna and Flora will be a challenging one. Its agenda is probably as exciting as its venue, UNEP's Nairobi headquarters. Among many proposals on a wide range of animal and plant species, there are at least four that will attract a great deal of debate and which demonstrate the need for CITES to ensure that decisions are taken in the light of extensive debate by the world's conservation community.

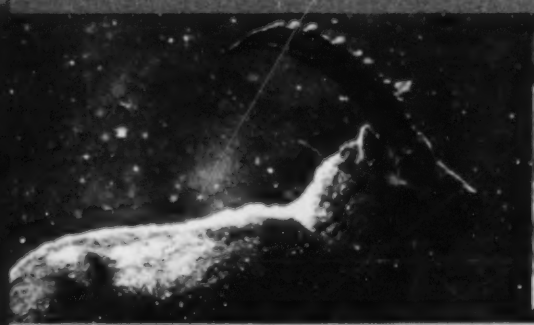
The first of these is the African elephant, where the debate will be about the best approach to its conservation from the different perspectives of individual range states, regions in Africa and for Africa as a whole. Japanese and Norwegian whaling is – although indirectly – on the agenda as well. Here the question is whether CITES' and the International Whaling Commission's coordinated levels of protection of gray and minke whale stocks need to be maintained. There are also three important proposals on the protection of sharks and one for reopening a certain level of trade in the hawksbill turtle.

To be able to usefully discuss these issues in Nairobi and at future CITES meetings of the Conference of the Parties, a strategic vision for the Convention should be adopted. I hope that in spite of the turmoil caused by discussions on the above-mentioned species, the Conference will find the time to adopt the proposed 'Strategic Vision through 2005, International Trade in any Wild Fauna and Flora shall be Sustainable'.

The purpose of this plan is to ensure that no species of wild fauna or flora becomes or remains subject to unsustainable exploitation because of international trade. It clearly focuses on a limited number of priority goals and objectives, and maps the Convention's direction at the beginning of this millennium. I personally find its adoption and the commitment of our 150 Parties to its implementation of the utmost importance. This will enhance the ability of each Party to implement the Convention, it will strengthen the scientific basis of the decision-making processes, promote greater understanding of the Convention, allow progress toward full global membership, increase cooperation and allow for strategic alliances with international stakeholders, contribute to the reduction and ultimate elimination of illegal trade in wild fauna and flora, and provide the Convention with an improved and secure financial and administrative basis.

I am confident that in spite of the many political aspects that complicate what in many cases should be straightforward scientific discussions, the CITES community will realize that we are all in this together and again demonstrate its undivided commitment to conservation. I am proud to be in a position to serve and facilitate that process and of the privilege of working with so many dedicated people to fight for the preservation of this planet and its inhabitants through the conservation of the world's wild animals and plants ■

Willem Wijnstekers
Secretary-General of the Convention on International Trade in Endangered Species of Wild Fauna and Flora



Jean Claude Bacle/UNEP/Topham

Joseph F. Darling/UNEP/Topham

TRADE IN WILDLIFE, and products made from it, is big business – worth up to $20 billion a year. A quarter of this is thought to be illegal.

Some 40,000 monkeys and other primates are estimated to be shipped across international borders each year, as are 2 to 5 million live birds, 2 to 3 million live reptiles, 10 to 25 million reptile skins, 500 to 600 million ornamental fish, 1,000 to 2,000 tonnes of corals, 7 to 8 million cacti and 9 to10 million orchids, and many other products. They are bought for a great variety of uses from pets to medicine, from food to fashion, from ornaments to scientific research.

Much of the trade is from developing countries, which contain most of the world's biodiversity, to developed ones, which provide the demand; the United States is even the biggest market for traditional Chinese medicines made from wild species.

The trade is driving many species towards extinction. But it need not do so. The United Nations recognizes that properly regulated trade, keeping the exploitation of species within sustainable levels, can bring much-needed income, especially to developing countries and their peoples.

For the last quarter of a century – through CITES – the world community has worked to bring it under control. Trade in species threatened with extinction is banned, and it is controlled where it might endanger species if left unrestricted. More and more countries have acceded to the Convention and it has done much to curb the ill-effects of the trade. But, as these pages show, some species are still endangered, and there is still much work to do ■

Geoffrey Lean

In less than a quarter of a century, between 1970 and 1994, sub-Saharan Africa lost 95 per cent of its black rhinos, (above) and the wildlife trade was the major reason. Other species, like the Javan and Sumatran rhinos, are also in grave peril. The prehistoric looking creatures, whose direct ancestors have lived on Earth for 40 million years, are killed for their horns. These have long been used in traditional Oriental medicine to cool fever (but not as an aphrodisiac, as popularly believed). And demand for rhino horn increased greatly in the 1970s as young North Yemeni men, prosperous from working in Saudi Arabia during the oil boom, bought daggers with ornamental handles made of it: the price of the horn increased 21 times during the decade. The trade has been illegal since 1977, but it still continues. Worldwide only 12,000 rhinos – from five species – still survive, though the decline in black rhinos has eased in recent years.

High fashion is driving the rare Tibetan antelope rapidly towards extinction. Its wool provides the gossamer light yet warm shahtoosh, prized by some of the world's richest women. It is so fine that a large shawl – which can cost up to $15,000 – can be pulled through a wedding ring. Yet at least three of the antelope are killed to provide the wool for each one. International trade in the wool has been banned for over 20 years, but demand remains so high that whole herds are still being gunned down by poachers, often with automatic weapons. Experts estimate that only about 70,000 of the antelope (below) now remain – down from over a million around 1900 – and that 20,000 are being killed every year for their wool. 'These are not shawls, they are shrouds,' says Dr. George Schaller, the biologist and explorer, who is Director of Science for the United States Wildlife Conservation Society.

Tigers ruled over a vast swathe of the Earth, from Turkey to Indonesia, for a million years. Now less than 7,500 remain. Three of the tiger's eight subspecies have become extinct since the 1940s and the rest are endangered. Overhunting and the loss of its habitat have both done much to reduce it to this state. But the most immediate threat to its survival now comes from poaching. Over the past 1,000 years almost every part of the tiger has been used in traditional Chinese medicine; now just its bones (below) are used – to treat rheumatism – but this is sufficient to fuel a large illegal trade.

Roland Seitre/Still Pictures

Roland Seitre/Still Pictures

The Chinese happy tree, which produces a chemical used to treat cancer, is in a sorry condition: less than 4,000 survive in the wild. The devil's claw, a southern African medicinal plant – used in drugs to treat arteriosclerosis, diabetes, hepatitis and other complaints – is under pressure from overharvesting. And the European herb, spring Adonis (below), used in homeopathy and folk medicine, is also under threat. Around 80 per cent of the estimated 1,000 medicinal plants in the Himalayan region of Lahaul and Spiti are estimated to have been severely depleted over the last decade to meet the increasing demands of the international medical and perfume industries. Some 20,000 to 30,000 tonnes of European medicinal plants are gathered from the wild each year, and some 150 species are threatened as a result.

Bob Gibbons/Ardea London

Elvio Rebora/Still Pictures

Millions of wild birds are caught and traded internationally every year, mainly to be sold as pets. Finches and parrots are the most popular, but, in all a quarter of the world's known bird species have been recorded in the trade over the past two decades. Hundreds of thousands die after capture, hundreds of thousands more perish in transit. Most of the trade is legal, but there is also a large illegal one, often in endangered species, such as salmon-crested cockatoos, Bali starlings, and red siskins; 250,000 birds are thought to be smuggled into the United States alone every year. Many, including the hyacinth macaw (above) and the red and blue lory, are endangered as a result, and the trade has helped to wipe out the last wild population of Spix macaws. However, since CITES came into force, the trade has declined as controls have tightened.

Pierre Pravel/UNEP/Topham

Jacqueline Pavia/UNEP/Topham

Populations of basking sharks – the world's second largest sea fish – have crashed all over the world. Their giant fins, which grow up to 2 metres tall, are in great demand for shark's fin soup; a single large fin sold for $15,000 last year. Sturgeon – which produce caviar – are also endangered; trade in products from two species of the 250 million year old fish is banned, and it is controlled for the other 25. And even the coelacanth (below), the 400 million year old 'living fossil' – whose discovery, after long being thought extinct, caused international celebration – may be put in peril by collectors.

Robert D. Ballard/UNEP/Topham

Artie Eisenberg/UNEP/Topham

Norbert Wu/Still Pictures

Jim Krieger/UNEP/Topham

Fritz Polking/Still Pictures

CITES was adopted in 1973 and came into force two years later. So far there are 150 Parties to the Convention, making it one of the world's largest conservation agreements. Its Secretariat is based in Geneva, Switzerland, and special Management Authorities in each member country issue permits for trade in species listed in the CITES Appendixes (see below). Each country must also designate a Scientific Authority to provide scientific advice on imports and exports. Approximately every two and a half years the Parties to the Convention meet at a Conference of the Parties (COP). COP11 is being held in Nairobi, Kenya, from 10-20 April, 2000.

The Convention offers varying degrees of protection to more than 35,000 species of animals and plants, depending on their condition in the wild and the effect that international trade may have on them. It bans international commercial trade in an agreed list of plant and animal species threatened with extinction – including cheetahs, snow leopards, tigers, all the big apes, many crocodiles and tortoises and birds of prey, and some cacti and orchids; these are listed in Appendix I of the Convention. Those that may become extinct if trade is is not strictly controlled – such as the rest of the cat, crocodile, primate and orchid species – are placed on Appendix II, where trade is regulated. Appendix III includes species regulated within particular member countries who need the cooperation of others to control cross-border trade; many bird species have been included here by Ghana, Malaysia and some other countries. Species are placed on the Appendixes, or moved between them, by consensus or a two-thirds majority vote at meetings of the commissions to the COP ■

Rosemary Watson/UNEP/Topham

WIN A PASHMINA shawl

Answer these three questions and tell us in not more than fifteen words what you would do to reduce the illegal trade in endangered wildlife.

1. How much is the trade in wildlife estimated to be worth annually? US$ _____
2. Less than how many tigers still remain? _____
3. Which fish, estimated to have lived on Earth for 250 million years, produces caviar? _____

'I believe the illegal trade in endangered species could be reduced if

_____

_____

_____

My name _____

Address _____

_____

_____

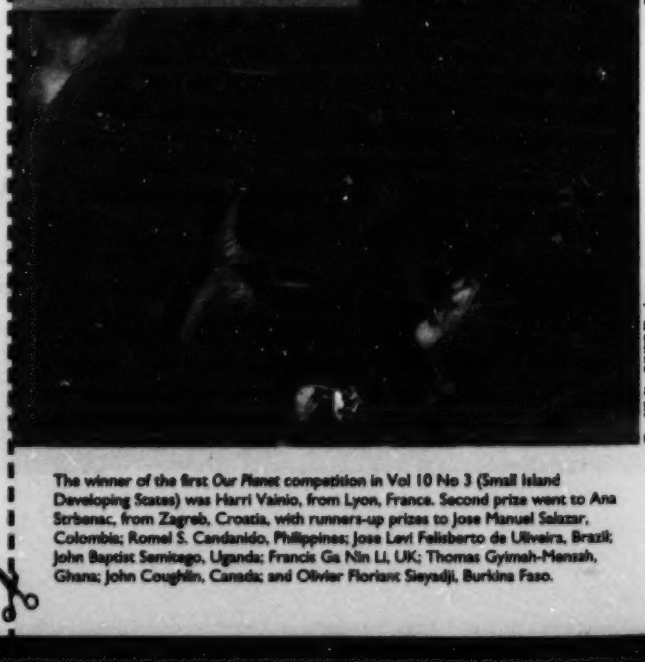
First prize a silk and cashmere pashmina shawl, donated by Marks & Spencer.

Three second-prize winners will each receive a copy of *Global Biodiversity*, published and donated by WCMC.

Three runners-up will each receive a copy of *Cultural and Spiritual Values of Biodiversity*, published and donated by UNEP.

Entries must be received by SMI, PO Box 119, Pin Green, Stevenage, Hertfordshire SG1 4TP, UK, or stop@ourplanet.com no later than 15 July 2000.

The winner and runners up will be chosen by a panel consisting of UNEP's Executive Director, its Director of Information, and the Editor of *Our Planet* from the entries received. The decision of the judges is final. This competition is closed to all those working for UNEP, Banson, Words and Publications, SMI, Marks & Spencer, WCMC, and all other companies associated with the production of *Our Planet* magazine and their families. A full set of rules is available on application from stop@ourplanet.com



Tan Yik Yee/UNEP/Topham

The winner of the first *Our Planet* competition in Vol 10 No 3 (Small Island Developing States) was Harri Vainio, from Lyon, France. Second prize went to Ana Strbenac, from Zagreb, Croatia, with runners-up prizes to Jose Manuel Salazar, Colombia; Romel S. Candanido, Philippines; Josse Levi Felisberto de Ulveira, Brazil; John Baptist Semiyago, Uganda; Francis Ga Nin Li, UK; Thomas Gyimah-Manzah, Ghana; John Coughlin, Canada; and Olivier Floriant Sieyadji, Burkina Faso.

Zsolt Sovari/UNEP/Topham

INTERPOL **alert**

RAYMOND E. KENDALL describes international efforts to beat the illegal wildlife trade

Poaching elephants and rhinoceroses in Africa, trafficking in bears' gall bladders and tiger parts, and smuggling rare parrots captured in the rainforests of Brazil are but a few examples of the world's illegal trade in endangered species of wild fauna and flora.

Wildlife crime is international, and cooperation between national and international law enforcement is essential if we are to come to grips with it, as with any kind of organized crime. It is a relatively new crime area for law enforcement agencies worldwide. A resolution asking member countries to cooperate in cases related to wildlife crime was adopted at the Interpol General Assembly in 1976.

This type of crime has received an increasing amount of attention from the public, politicians, and subsequently the law enforcement community, since the beginning of the 1990s. Separate law enforcement units investigating wildlife crime have been established in some countries, though others still lack appropriate legislation and enforcement structures.

It is urgent that all Parties develop proper enforcement structures

Wildlife crime is a general phrase covering such different kinds of criminal activity as poaching, capture/collection from the wild, smuggling, possession, and illegal import or export of endangered species of wild fauna and flora. The criminal activities differ from country to country, depending on the fauna and flora available. They include, to mention just a few examples: poaching elephants and rhinoceroses in Africa (for the illegal traffic in ivory and rhinoceros horn); smuggling rare parrots captured in the rainforests of Brazil; smuggling caviar from the Caspian Sea area; the illegal trade in shahtoosh shawls made from the wool of the Tibetan antelope; smuggling tortoises, turtles and other reptiles; smuggling of cacti and cycads; the illegal trade in bears' gall bladders and tiger parts; and the illegal collection of wild birds' eggs.

The numbers of some endangered species have recently diminished significantly and illegal hunting is one factor behind this dramatic decline in numbers. For example, there are now estimated to be about 2,200 black rhino compared with 65,000 in 1970.

Prices on the black market are high for these rare animals, plants and products and – as in any other kind of crime – criminals are attracted by the profits available. According to the United States Fish and Wildlife Service, a Komodo dragon – the world's largest lizard – and the tuatara – a reptile that is one of the Earth's ▶

oldest species – fetch approximately $30,000 each on the black market, while the radiated tortoise from Madagascar sells for about $5,000.

Illegal trafficking is often carried out by professional couriers who, for a fixed price, smuggle animals or plants from country to country concealed in their vehicles, their luggage, or on their bodies. Other smuggling methods are to use shipping containers (e.g. for illegal ivory traffic) or the express dispatch services system.

The main 'producing' countries are in Africa, South and Central America and Asia, while the main 'consumer' markets are in Europe, North America, and the Middle and Far East (Japan, the Republic of Korea and China). Some countries, such as Canada and Australia, may be categorized as both producing and consuming.

Criminal networks

In some cases we have seen links with organized crime, the drug trade, illegal possession of weapons and money-laundering. Illegal traders often resort to fraud, making false statements to the authorities, and forging documents to promote their unscrupulous business. Like most criminals today, they also use the new information technology, such as the Internet, and modern communication techniques (e-mail, fax and mobile phones) to facilitate their illegal trade across the globe.

Interpol is actively engaged in the fight against wildlife crime because national and international law enforcement cooperation is essential to combat it. The first meeting of the Interpol Sub-Group (now the Interpol Working Group on Wildlife Crime) was held in The Netherlands in 1994 and was attended by experienced wildlife crime investigators from all parts of the world. The Working Group's objectives are to:

- Improve the exchange of information (including criminal intelligence) on persons and companies involved in the illegal trade in wild flora and fauna.
- Support investigations into illegal activities related to wildlife crime by improving national, regional and international law enforcement.

Tod Clustvik/UNEP/Topham

- Exchange information on methods and trends in this illegal trade with the purpose of developing a more proactive approach.
- Develop training and information documents needed for the investigators.

It meets on a regular basis and is now also planning to establish regional wildlife crime working groups for law enforcement officers.

Since the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) entered into force in 1975, all Parties ratifying it have been obliged to introduce their own national laws to penalize the illegal trade in endangered species of wild fauna and flora. Unfortunately, so far, not all Parties have established the appropriate legal framework at national level. This means that, in some countries, the enforcement structure is non-existent.

It is urgent, therefore, that all Parties develop proper enforcement structures and that the appropriate laws are internationally harmonized. Interpol is working very closely with the CITES Secretariat on the enforcement issues of the Convention. This cooperation has resulted in a Memorandum of Understanding (MOU), which was signed by the CITES Secretariat and the Interpol General Secretariat in October 1998.

Although this MOU is not formally binding on the national authorities, it urges the CITES authorities and law enforcement agencies – police and customs – to work closely together in each country in order to combat wildlife crime more effectively. The *Practical Guide on Co-operation between the CITES Management Authorities and Interpol* is now available in English, French, Spanish and Arabic and will be distributed to the appropriate authorities in the spring of 2000.

Common obligation

Safeguarding the environment and protecting the planet is an obligation for us all. As law enforcers we can make a difference to the illegal trade in endangered species by ensuring that those who break the law are adequately dealt with and that proper sanctions are imposed.

It is imperative that we raise awareness of the disastrous effects of wildlife crime. We must make the world realize the importance of preventing the illegal trade in endangered species of wild fauna and flora, and of taking effective law enforcement measures against these crimes to bring the perpetrators to justice. Extinction is final: if we wish to protect and preserve the natural heritage for generations to come, we have to act now ■

Raymond E. Kendall is Secretary-General of the International Criminal Police Organization, Interpol.

INTERPOL, the International Criminal Police Organization, which has a membership of 178 countries, aims at 'ensuring and promoting the widest possible mutual assistance between all criminal police authorities, within the limits of the laws existing in the different countries and in the spirit of the Universal Declaration of Human Rights'. Its vision is to help create a safer world by optimizing the international effort to combat crime.

The Interpol General Secretariat currently processes about 2.5 million messages a year, whilst the General Secretariat database contains over 300,000 criminal files.

D. Fugit/UNEP/Topham

Deep waters high stakes

MICHAEL E. HUBER says that most of the world's biological heritage lives in the seas, and calls for its protection

How many fishes – or worms, snails or seaweeds – are there in the sea? In spite of intensified scientific study, and sometimes heated debate, the answer remains elusive.

It was long thought that the ocean harbours far fewer species than the land. Of the 1.8 million species identified and named by scientists, only around 275,000, or 15 per cent, are marine. Yet, as only a fraction of living species are known to science, these numbers fall far short of the world's real diversity. Estimates vary wildly, but a middle-of-the-road guess is that, in reality, there are actually 10 to 30 million species on the land alone, suggesting that only a tenth or less of terrestrial species has been identified.

Many marine scientists think this problem is much more acute at sea. They think that the real reason that so few marine species are known is not because the biodiversity really is low, but because the ocean has been so poorly studied. It is vast, taking up some 95 per cent of the living space on Earth, and is mostly remote and extraordinarily hard to access. Scientists have sampled only about 7 per cent of it.

Speculation and controversy

There may be at least as many species in the seas as on land. A 1992 study estimated that 10 million or more invertebrate species live on the deep-sea floor alone. By another estimate, there are at least a million coral-reef species.

These estimates are controversial, but there is no question that the oceans harbour most of the world's biodiversity at a higher biological level. Life originated in the sea, and most life forms never left. Of the 34 major animal groups, or phyla, all but one occur in the ocean and 15 are found there alone. By contrast only 15 animal phyla live on land; 17 in freshwater. While most terrestrial species belong to a single group – insects – the richness of marine species is distributed among a number of major groups, with fundamentally different body architectures and lifestyles. Thus, the sea nurtures most of our planet's biological heritage.

This store of biodiversity is of immense value. It provides food, fertilizer, pharmaceuticals, jewellery, clothing and additives to food, cosmetics and household products. With so many species undiscovered, the potential for new products is vast.

The services provided by marine ecosystems – such as regulating the atmosphere and climate, protecting coastlines, purifying water and providing opportunities for tourism and recreation – are even more important. By one recent calculation, marine goods and services are worth $20 trillion annually, comparable to the entire global gross domestic product. Regardless of its value in economic terms, marine biodiversity is essential to the very existence of life on Earth and therefore truly invaluable.

Unfortunately there is growing evidence that, as on land, it is under threat. Rich coastal habitats around the world have been destroyed by landfills, dredging, damming or channelling rivers, and other coastal developments. Half the world's mangrove forests, for example, are already gone.

Most of the world's commercial fisheries are under intense pressure, threatening not just the relatively few species targeted but the many more that are taken as by-catch or whose habitats are disrupted. For example, trawling for cod and other species has driven once abundant skate on the east coast of North America to the brink of extinction. Parts of the North ▸

The global community must take urgent steps to protect marine biodiversity

Sea floor are trawled eight times a year, presumably with dramatic impacts on seabed communities.

Pollution gets everywhere. Persistent toxic substances like DDT and PCBs have poisoned seabirds and marine mammals and may have broader, more subtle effects on ecosystems. The massive alteration of ecological cycles is even more alarming. More than half the nitrogen entering the ocean now comes from human sources: the effects are not well understood, but have been associated with blooms of toxic phytoplankton and great 'dead zones', nearly devoid of oxygen, in the seas. The ecology of phytoplankton, vitally important in removing carbon dioxide (CO_2) from the atmosphere and producing oxygen, could be altered on a global scale.

Exotic issues

The introduction of species to places far from their home waters, where unchecked by natural controls they sometimes crowd out native biota, is an ever increasing problem. The possible effects of rising temperature, increased CO_2 and ultraviolet radiation levels – as a result of global warming and the thinning of the ozone layer – are still uncertain, but there is increasing cause for concern. Coral reefs, for example, may be directly affected by increased CO_2 in the atmosphere as well as by the rising temperatures it brings.

Biologists once thought that marine species were practically immune to extinction because currents spread their drifting larvae over huge areas, making it hard to wipe them out. Recent evidence, however, suggests that many marine species range much less widely over the oceans than previously realized, and so are more vulnerable. And even widely distributed marine species have been driven to extinction.

Losing certain 'keystone' species can have cascading effects. Sea otters like to eat sea urchins, which in turn eat kelp and other seaweeds. As otter populations have crashed in the Aleutian Islands, urchins have proliferated and are eating their way through species-rich kelp forests. Killer whales, unable to find enough of the seals and sea lions they prefer, seem to have switched to eating otters. And scientists

Denis Page/UNEP/Topham

Jean Tao/UNEP/Topham

speculate that the seals and sea lions have declined because their food has been decimated by commercial fishing.

We know too little about such interlinkages to predict how life in the oceans – and therefore the entire planet – will respond to our continuing insults. There is much to learn at even a basic level. We now realize that the deep sea is highly diverse, though thought lifeless only a century and a half ago. New discoveries have recently revolutionized our view of marine ecosystems. Microbes so tiny that they went undetected for centuries have been found to dominate much of the sea's primary production, for example.

Superficial understanding

We do not really understand the 'biological pump' of CO_2 from the atmosphere to the deep sea, which critically modulates the greenhouse effect. We have only recently learned that the availability of iron controls primary production over huge areas of the sea. Entire ecosystems, depending on chemical energy rather than the sun, have been discovered at deep-sea hot springs. With our superficial understanding of the oceans, we cannot gauge the prospects for global marine biodiversity, or the consequences of losing it – but we do know the stakes are high.

The global community must take urgent steps to protect marine biodiversity. These include the integrated management of coastal areas, establishing effective marine protected areas, fishing more sustainably, empowering communities in the developing countries that host much of the world's coastal diversity, and improving the control of pollution. Much of this has been started, for example through UNEP's programmes to protect regional seas and control persistent organic pollutants, and the Global Programme of Action for the Protection of the Marine Environment from Land-based Activities. It will take worldwide commitment over many years to see these and other efforts through to their culmination in the long-term protection of marine biodiversity ■

Dr. Michael E. Huber is Senior Partner, Global Coastal Strategies, Brisbane, Australia.

Tall trees and **bottom lines**

THOMAS LOVEJOY describes the essential services provided by forests and the biodiversity they shelter

When I was at school a strange group of fungi – that in one part of their life cycle behaved liked amoebae, at other times acted like standard, if tiny, fungi – caught my young attention. They were called slime moulds, but nicknamed 'Magic Myxies' (from their formal name Myxomycetes).

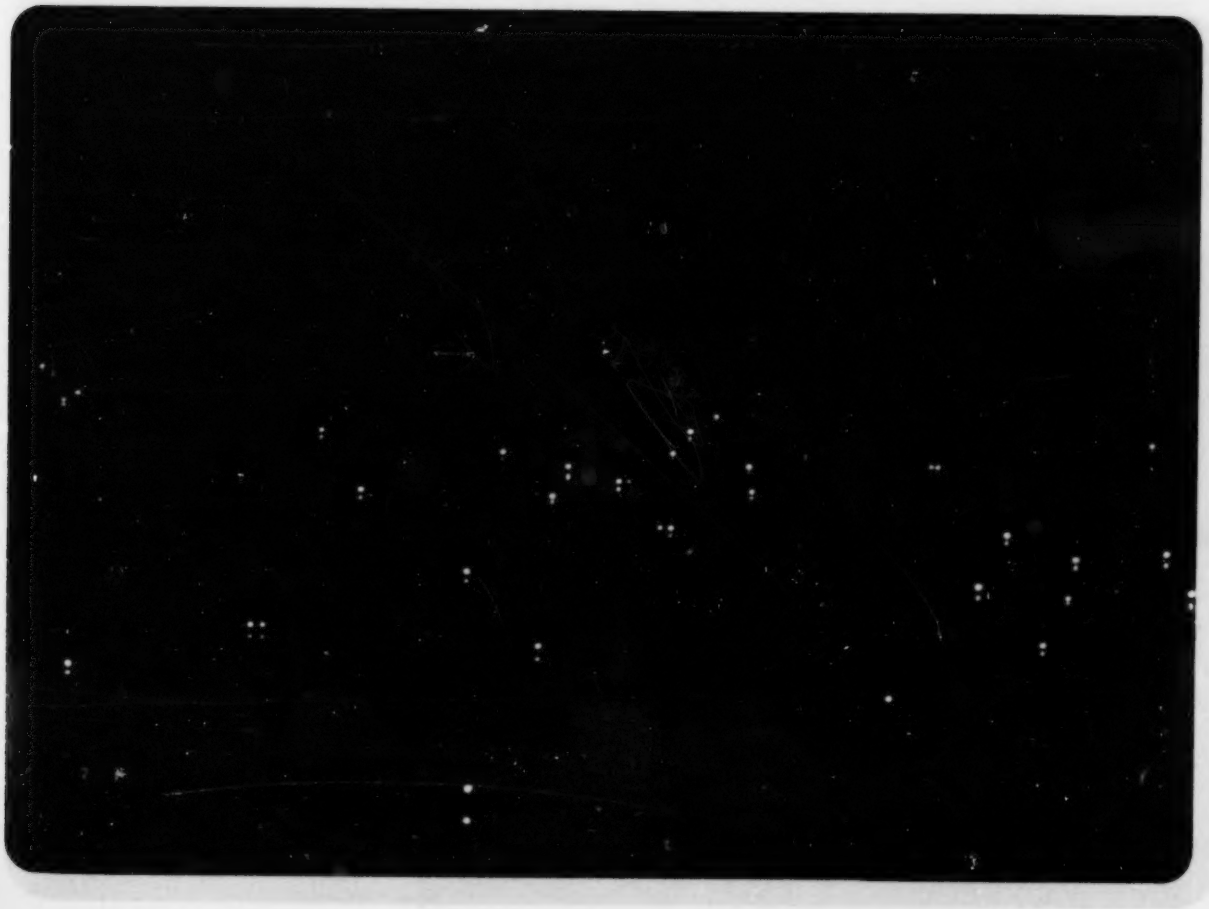
Nobody seemed to know much about them so all that lingered with me until recently was a sense of curiosity. Now they are the hottest thing on the cancer 'beat', because the slime on which they move contains a group of chemicals, the epothilones, which seem to work on taxol-resistant cancers. Taxol itself is a relatively recent anti-cancer drug which halts tumour growth in ovarian, breast and lung cancer: it was originally isolated from the Pacific yew, a tree in the old-growth forests of the Pacific northwest, that used to be trashed as worthless by clear-cutting loggers.

An unread book

Finding the powers of epothilones and taxol, compounds which play important roles in the life cycles of these organisms, is part of the continuing chain of discovery about living systems derived from biological diversity. As both examples demonstrate, it is hard to predict where such discoveries are likely to be made within the kingdoms of life. It is wondrous really. The role biodiversity plays as the basic library for the life sciences would be reason enough for its conservation. Yet it is only one cause for concern about the accelerating loss of species around the world.

Biological diversity is under assault in virtually every kind of habitat, terrestrial or aquatic. Virtually every environmental problem or stress affects it. So its loss is both a problem in itself and integrates all environmental issues. In essence biological diversity ▸

Biological diversity represents the bottom line of human impact on the globe



John Moran/UNEP/Topham

represents the 'bottom line' of human impact on the globe.

The impact on forests is dramatic. It is so great that probably more than a billion tonnes of carbon are generated as carbon dioxide (CO_2) in the course of destroying and burning forests each year, compared to 6 billion or so from the burning of fossil fuels. Furthermore, deforestation is usually thought of as the single greatest generator of extinctions, since forests, especially those in the tropics, represent one of the richest natural stores of plant, animal and microorganismal species on the planet.

One of the many causes of forest loss is the usual lack of recognition of the ecological services that they provide. Take their role in the global carbon cycle and the increasing concentrations of greenhouse gases. We know that reforestation can absorb important amounts of CO_2 and convert it into the carbon the trees need to grow. It now also appears that tropical forests are responding to higher levels of CO_2 in the atmosphere by sequestering more carbon. If natural forest escapes destruction, it prevents an increase in CO_2. So from a biological diversity perspective it would be very desirable for natural forests to be included in the Clean Development Mechanism under the Climate Convention, which would allow payment for this ecological service. Costa Rica already has Certifiable Tradable Offsets ready for sale.

There are of course technical and complex issues to be resolved about what would qualify and how credit should be given, but trees and forests nonetheless represent an easy way to start addressing the CO_2 problem. Further, carbon payments could make a substantial difference to the economics of maintaining natural forest – as opposed to cutting it down – because they can become one of a number of income streams for the same area of forest (provided other income streams do not diminish the forest's carbon content).

James Burton/UNEP/Topham

Luis Carlos Rosa/UNEP/Topham

Khoo Su Hong/UNEP/Topham

R. Gopinadhan Nair/UNEP/Topham

Climate change is likely to have a devastating effect on biological diversity. So carbon offset income for natural forests is probably the single most important measure which can be taken for biological diversity because it conserves it directly and reduces greenhouse gases at the same time.

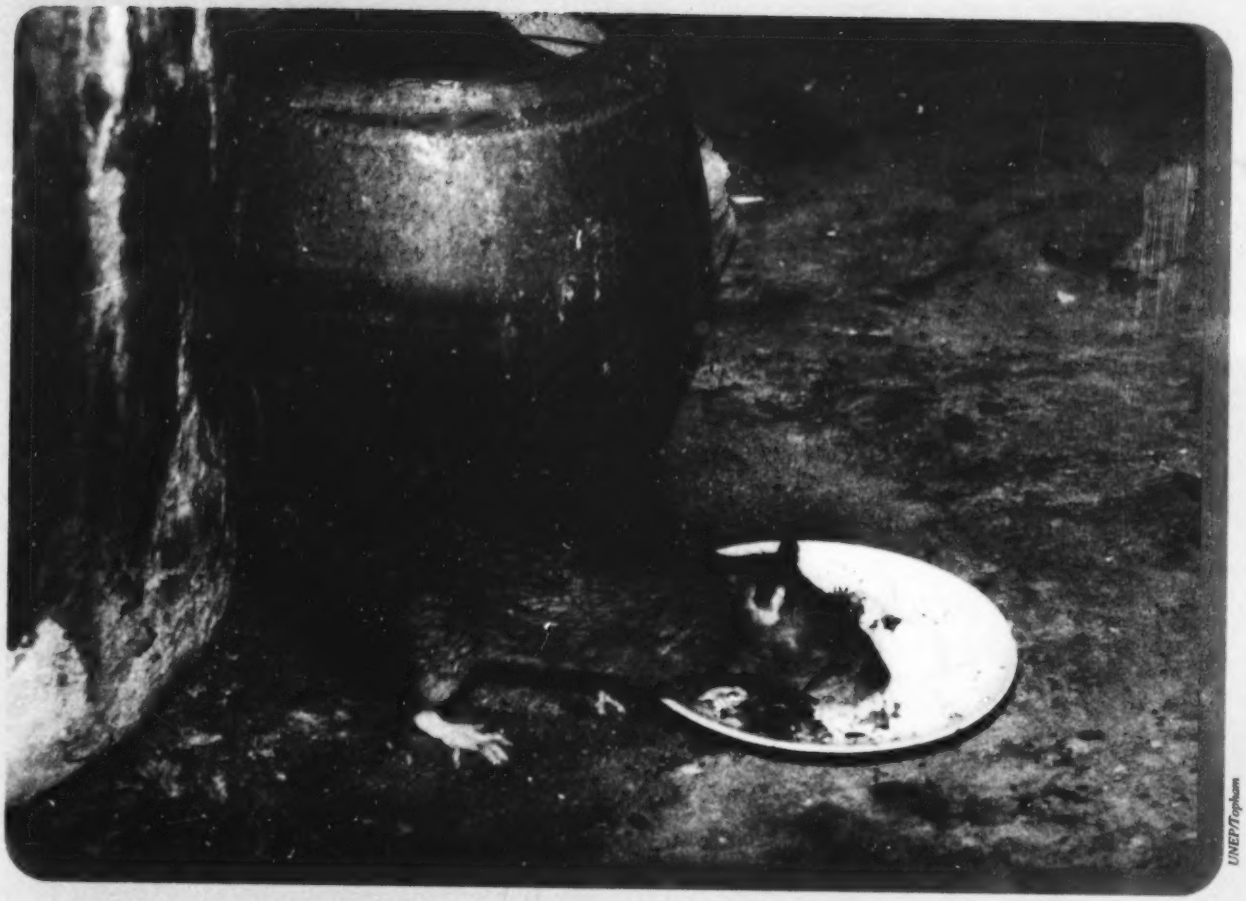
Disaster prevention

Recent events in Venezuela and Honduras have illuminated yet another ecological service of forests – disaster prevention. Deforestation clearly played a role in aggravating the devastating floods associated with Hurricane Mitch and the ghastly Venezuelan floods and mudslides last December. Both were only partially 'natural disasters', ones that will doubtless be visited on other countries with similarly bare hillsides. Quite apart from humane considerations, you do not need a Nobel Prize to conclude that it is better economically to stabilize slopes with forests than to suffer disasters like these.

Then, of course, there is the service that forests provide in supplying reliable flows of clean water. Here, at least, there are signs that the authorities are recognizing their importance. New York City found that it was ten times cheaper to restore its watershed – so that biological diversity could clean its water properly – than to build and operate a treatment plant. In Costa Rica watershed owners, both public and private, are beginning to be recompensed for providing water, whether for drinking or for generating electricity. Quito's Mayor, Roque Sevilla, calls forests 'water factories'.

All these, of course, are only some of the reasons why forests and biological diversity are important. There are many others, including the value of many forest products or such intangibles as their beauty and wonder. They all argue for a more sensible treatment of forests and the living things like 'Magic Myxies' which go to make them up ■

Biologist Thomas Lovejoy is Chief Biodiversity Advisor at the World Bank and Counsellor at the Smithsonian Institution.



UNEP/Topham

Globalizing SOLUTIONS

MARK COLLINS suggests a framework of action to move biodiversity up the global agenda

Unless you happen to be a rat or a cockroach, it is hard to see good in globalization. Since the 1940s the trend for species and ecosystems, the world's 'biodiversity', has been persistently downhill, and much of this is due to elements of the globalization process.

Introducing species into exotic habitats, clearing forests to feed demand on other continents, shipping pesticides to every corner of the world – all this is fuelled by global transport and markets. This is not to say that no good can come from globalization: but it is clear that its challenge is getting tougher. Both regulatory and mitigating measures must be taken soon.

WWF's Living Planet Index – the nearest we have got to developing a Dow Jones index for the living world – produces clear evidence. There has been a 30 per cent decline in the world's living assets since 1970, and the downward trend is continuing at 1 per cent or more per year. UNEP's *Global Environment Outlook* (GEO) confirms a similar picture.

These huge losses in our asset base and quality of life do not lead to the response from world citizens that they deserve – so long as they are happening in someone else's back yard. Even when the loss of resources, services and benefits deriving from the natural world destroys communities and their economies, the memory soon fades. We move on to make a dollar somewhere else, albeit from a reduced asset base, often leaving an impoverished community in our wake.

A common good

Fishing grounds destroyed in the Atlantic; productive forests mismanaged and burnt in Southeast Asia; mudslides wiping out towns in Central America; rangelands overexploited in Africa – check out *GEO 2000* for the facts and figures.

Time and space are running out. Something has to be done, and now. But individual citizens, private companies, and even national governments, seem to find it hard to combat the loss of biodiversity.

Much of biodiversity is a common good. If we are to avoid the tragedy of the commons – uncontrolled and selfish overexploitation – we must combat the unwanted effects of ▸

globalization with intellectually robust and well-funded global systems of stewardship and governance. Nations must agree about how globalization can operate within the limits of environmental sustainability.

What sort of global framework do we have for managing biodiversity? Is it working? We have a raft of international conventions, on wildlife trade (in force since 1975), wetlands (1975), migratory species (1983), World Heritage Sites (1975) and regional seas. The Convention on Biological Diversity (CBD, 1993) seeks to build shared programmes with these as well as with the treaties on climate change and desertification, which were also approved at the Rio Earth Summit.

But there is a long way to go before we could claim that there is a strategic framework in place. To outside observers, such as in the private sector, it looks pretty muddled. Nations around the world find their implementation and reporting obligations to be disjointed, duplicative and expensive. Many believe that the processes of these treaties have become ends in themselves, with the plight of species and ecosystems a distant and ill-defined target.

Give and take

If there is some truth in this diagnosis, what is the medicine? First we need a strategic plan that engages all the biodiversity-related treaties in a coherent framework of global governance and endeavour. This must be communicated widely to citizens and the private sector, as well as to governments. It will need some give and take between the treaties, and some political will from nations, not all of whom have signed up to the same ones.

George V. Cahig/UNEP/Topham

Alice Walsh/UNEP/Topham

Achieving this will certainly need strong scientific and political leadership and sound knowledge of the status and trends in biodiversity. Who can provide this? The CBD never had a scientific panel along the lines of the UNEP/World Meteorological Organization Intergovernmental Panel on Climate Change (IPCC). The Subsidiary Body on Scientific, Technical and Technological Advice was created to do the job, but it has not proved easy to run it along scientific and objective lines.

We need an International Panel on Biological Diversity, composed of eminent scientists from around the world, and supported by the best sources of information available. Such an idea was discussed at a CBD brainstorming in Oslo last November, and it is catching on. But it needs to have a remit across all the biodiversity-related conventions, not just the CBD.

Strategic integration

The Panel should be charged both with carrying out any needed assessments and with exploring ways for the biodiversity-related treaties to work together in a strategic framework towards agreed scientific priorities. It must be supported by a global network of biodiversity information centres.

At the global level the World Conservation Monitoring Centre (WCMC) is ready to offer its 20 years of experience in compiling and evaluating information on biodiversity and biological resources worldwide, and aims to enhance global, regional and national capacities to handle it. By mid-2000 WCMC will – in consultation with governments, conservation organizations and other partners throughout the

world – be reconstituted as a new UNEP world biodiversity information and assessment centre.

There is already a strong network of Collaborating Centres (including WCMC) under the UNEP process that delivers the world's best commentary on the environment – the GEO. The network has proved its worth, and needs to be financed and expanded to engage and empower the world's key centres to deliver knowledge on biodiversity.

The network can be supported by the Biodiversity Conservation Information System (BCIS), a consortium of data-rich non-governmental organizations that are working together to share and mobilize information. Good methodologies, such as WWF's Living Planet Index, need to be developed further to deliver clear and concise indicators of change.

Globalization is proving costly for the world's variety of life. The way ahead is to coordinate and focus existing international tools of governance and stewardship to create synergy, clarity of purpose and value for money. We must communicate the biodiversity agenda clearly and precisely so that citizens and private companies can understand what is needed. At the same time we must enhance the quality of our scientific knowledge by building and empowering regional and national biodiversity research and information centres. Analytical tools and indices will be needed to translate the information into knowledge, and there must be an international panel to provide the necessary leadership and strategic focus ■

If we are to avoid the tragedy of the commons we must combat the unwanted effects of globalization

Mark Collins is Chief Executive of the World Conservation Monitoring Centre, Cambridge, United Kingdom.

Global Biodiversity Earth's living resources in the 21st century

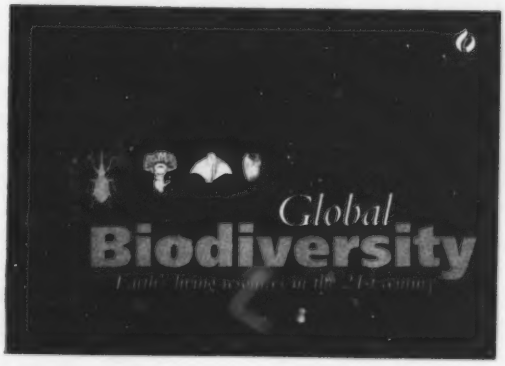
In the year that the Convention on Biological Diversity (CBD) was opened for signature, the World Conservation Monitoring Centre (WCMC) published an extended introduction to the then unfamiliar term 'biodiversity' – ***Global Biodiversity: status of the Earth's living resources***. Now, thanks to the support of the Hoechst Foundation, WCMC has been able to build on nearly a decade of further research and analysis, both its own and that done by the wider conservation community, to publish a second volume, ***Global Biodiversity: Earth's living resources in the 21st century***. This outlines some of the broad ecological relationships between humans and the rest of the biosphere, and summarizes information bearing on the health of the world.

The first part of ***Global Biodiversity*** opens with an outline of some fundamental aspects of material cycles and energy flows within the biosphere. This is followed by discussion of the components of biological diversity, and an account of its expansion through geological time as well as the pattern of its distribution over the surface of the Earth.

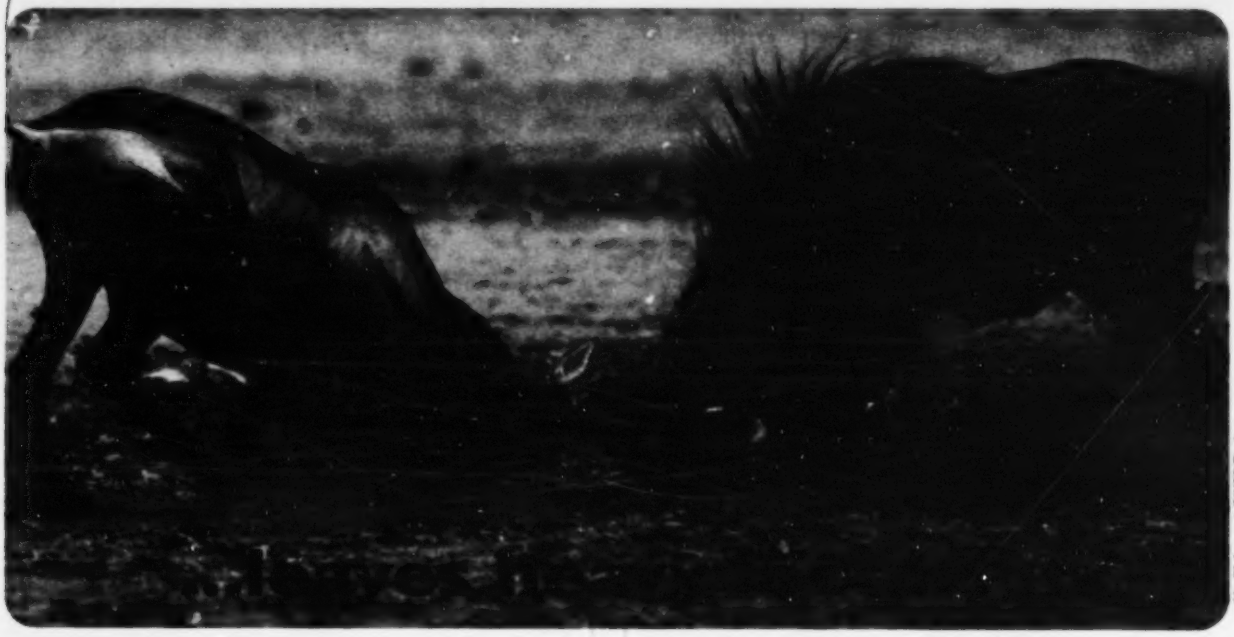
The second part is concerned with material relationships between humans and biodiversity, covering the salient features of our impacts on the environment from the earliest hominids onwards, and the uses currently made of elements of biodiversity. This part also summarizes information on trends in the condition of the main ecosystem types and the species integral to them, contributing to objective analysis of the state of the biosphere at the dawn of this third millennium.

'***Global Biodiversity*** deliberately refrains from making any predictive statements about where humans' current behaviour patters may ultimately lead us,' the authors, Brian Groombridge and Martin Jenkins explain. 'Rather it attempts to present a balanced portrait of the living Earth at the end of the 20th century. It is our hope that ***Global Biodiversity*** may serve as a frame of reference for our future actions, actions that will help determine how long we, as a species, continue to enjoy a place amongst the other denizens of this strange, blue planet.'

Global Biodiversity: Earth's living resources in the 21st century is published by WCMC, price £29.99 ($50.00) plus postage and packing. For proforma invoice contact:
WCMC, 219 Huntingdon Road
Cambridge CB3 0DL, United Kingdom
Tel: +44 1223 277314; Fax: +44 1223 277136
E-mail: info@wcmc.org.uk



WALKING ON THE WILD SIDE...



Liv Plakomaris/UNEP/Topham

GREG NEALE describes the impact tourism has on biodiversity and points to ways in which it can be reduced

All industries are subsidiaries of the world's natural systems and resources, but few depend on them as obviously as tourism, the largest of them all. Wildlife and wild places beguile hundreds of millions of people a year away from their homes, and send them back refreshed.

In the process they provide jobs and economic development, particularly valuable in developing countries. The World Travel and Tourism Council (WTTC) has estimated that by the year 2005, the travel industry will have created employment for 305 million people and will be producing 11.4 per cent of the world's gross domestic product. It can help nations develop infrastructure – roads, water and power supply networks, hospitals and schools. Less tangibly, but equally importantly, it offers the possibility of increasing international understanding. But tourism also has serious ill-effects on the very resources on which it depends, reducing biodiversity, destroying habitats and ruining landscapes.

Transport is one of the major contributors to global warming, perhaps the greatest long-term threat to biodiversity and habitats. The Intergovernmental Panel on Climate Change (IPCC) estimates that air travel alone is responsible for at least 3 to 3.5 per cent of the climate change being caused by the emission of greenhouse gases. Back on the ground, vehicle exhaust emissions are an even greater source of carbon dioxide, while also damaging our health, the fabric of our historic cities and the natural environment.

Widescale disruption

In Greece and some other Mediterranean countries, the building of tourist hotels and discotheques has disrupted turtle nesting sites, or driven birds from breeding colonies. Raw, untreated sewage pumped into the oceans from tourist hotels damages the health of coral reefs and bathers alike. Tourist litter and rubbish kill unwary wildlife around the world, and overwhelm natural habitats, particularly on small islands.

Even so-called eco-tourism can put undue pressure on fragile regions. The tramping feet of tens of thousands of hillwalkers has seriously eroded mountain paths in Britain's Snowdonia and Lake and Peak Districts. Even in the wide open spaces of Kenya's national parks, too many nature loving tourists searching after wildlife can put severe pressure on wildlife and the environment.

In East Africa, Asia and southern Europe, water sources traditionally used by local people have been diverted to supply newly built tourist hotels and lodges. In Southeast Asia and in Hawaii, local farmers have lost their land to golf courses, often without adequate compensation. Tourism has also sharpened inequalities of wealth, disrupted societies and cultures and devalued sacred places.

There are, however, some encouraging signs. Moves are already under way to 'green' conventional

Even so-called eco-tourism can put undue pressure on fragile regions

travel and tourism. Over the last decade, passenger aircraft efficiency has doubled. The InterContinental Hotels and Resorts Group cut energy costs in its hotels by 27 per cent between 1988 and 1995. More and more companies have been signing up to the Green Globe initiative, and instituting staff and training programmes with sustainable development in mind. Others support initiatives such as those of Tourism Concern, or of the Friends of Conservation group where money donated by the industry is put back into local initiatives, for example publicizing conservation imperatives, or funding community development. Certification schemes can encourage good practice through helping consumers make informed choices while prizes, like the Tourism for Tomorrow awards, stimulate and publicize awareness of sustainable development.

Such improvements must continue, particularly given the projected growth of tourism. We should seek to reduce the need to travel, and plan to shift more tourism to public transport, cycling and walking. And we should increasingly adopt cleaner, renewable energy, waste reduction and conservation activities.

Mobilizing tourists

The spread of 'volunteer' and 'conservation' tourism is another encouraging trend. The Earthwatch Institute in Britain and North America mobilizes the energy and interest of people who want to take holidays where they actively pursue conservation. Since 1972 it has supported more than 1,920 projects in 118 countries, contributing, it estimates, some 5.8 million work-hours to field research on such diverse subjects as assessing the effects of tourists swimming with dolphins in New Zealand, investigating the impacts of acid rain on the forests of Bohemia, studying traditional herbal medicine in Argentina and measuring pollution off the Russian coast in the Sea of Japan.

Every year the British Trust for Conservation Volunteers (BTCV) brings together more than 95,000 volunteers from all sections of the community for short holidays that include, for example, repairing and building dry stone walls, coppicing woodland, conserving coastal sand-dune nature sites, protecting ancient hay meadows and restoring ponds. Internationally, its volunteers are also engaged in such activities as restoring traditional fishing huts in Iceland, helping naturalists radio-track wolves in Poland and building a tortoise breeding centre in Senegal.

Benefits for local people

Wildlife tourism, properly conducted, can also produce funds for nature conservation, stimulate the political will to protect biodiversity, and benefit local communities. Since the decline of the commercial whaling industry, for example, increasing whale watching has steadily helped regenerate some coastal communities. Between 1992 and 1997, the number of whale watchers increased by 10 per cent a year, and the number of countries where this is a significant tourist activity more than doubled. By 1994, 5.4 million people were whale watching, generating a revenue of $311 million, and helping to 'foster an appreciation of the importance of marine conservation', concluded one British Government study.

Of course, tourism in remote wilderness areas must be carefully regulated and involve the consent of local people. But, at its best, nature tourism can provide a new awareness of the fragility of our planet, and – equally important – of the needs of its people. And there is growing evidence that the increase in activity holidays – such as hiking, sailing, cycling or camping – is encouraging more and more people to enjoy simpler lifestyles.

Other developments seek to remind travellers that they belong to a large human family. Newly established local companies are now promoting community tours in some of South Africa's cities, while a scheme in Senegal encourages tourists to share the lives of West African villagers: the money they spend goes directly to supporting health clinics or schools, agricultural projects or even local football teams.

'Take only photographs' it is said, 'leave only footprints'. The adage may be becoming a little worn, as the world becomes aware of just how deep a footprint tourism can leave behind on the world's wildlife and wild places. Only if we learn to attune our leisure to the natural systems we come to admire, will we prevent it becoming more crushing still ■

Nyaung U. Po Chor/UNEP/Topham

Greg Neale, author of The Green Travel Guide *(Earthscan), was Environment Correspondent for* The Sunday Telegraph, *London, from 1989-1999. He is currently engaged on research at Oxford University.*

Voices of the Earth

The term 'biodiversity' does not exist in my people's understanding or knowledge. If I were to translate the term into our language, I would say it was everything in this world, down in the sea, and things we can touch. At the same time, it is more than this – more than just things that can be touched or things that are alive. The air, the water and the sun also must be included.

Also there is a spiritual aspect to what is the part of biodiversity. Although our peoples embrace Christianity, Islam or whatever, we believe in the existence of spirit. The spirit is more like a guide, something that you must respect or be conscious of. It could be the spirit of the land, the spirit of things that live on trees or rocks, or even your ancestor spirits.

In our language there is something called *adat*, an unwritten understanding of common things that everyone should know. It is often described as a traditional legal system, but, to the indigenous people, it is much more, encompassing a set of beliefs and values that affects all aspects of life. It is a set of unwritten rules and principles that extends to everything and to relationships within both the physical world and the spiritual world.

Everything is inhabited by some kind of spirit and there is a proper way to conduct relationships with them. All things are in balance and any disturbances in the spirit world may affect other members of the Earthly family or the community.

Adat is closely linked to agricultural practices and the management of the ecosystems. There is a wealth of ritual and ceremony involved, especially with the swidden system, which aims to redress the balance of nature that agriculture temporarily interrupts. The whole process of work thus brings individuals in contact with the spirit world, and if this should cause conflict between the spirits, the consequences may be felt by the whole community. This, in turn, undoubtedly encourages communal work and the sharing of responsibility for any activities that may adversely affect the spirit world.

Patrick Segundad *Kadazan people, Malaysia*

Before we make any decisions, we consult our ancestors first. We remind ourselves about our central spirits, we talk to them and then they give us the go-ahead. Before we touch the land we go to the spirits. The spirits are linked to certain animals or trees.

Ralph Mogati *Korekore people, Zimbabwe*

Somebody from the continent of the Great Turtle Island, today called America, said that I don't need to go to university to learn about biodiversity. I believe what he said is the truth.

Biodiversity is described by science in terms of the metals, rock, sand, water and so on, the things that the scientists themselves can explain. On the other hand, an indigenous person's explanation of the biodiversity of a river, sea, coral reef, island or waterfall has a fullness in that it also includes the biodiversity of a village, both in the world where humans live and in the world where spirits live.

If we don't know how to respect the indigenous laws, the relation of the culture to the environment, man, and spirit which must be maintained at all times will be upset. If the relation is not maintained harmoniously, then things go wrong with biodiversity.

Scientists are jumping up and down saying: 'What's going wrong with Planet Earth?' Indigenous people know a great deal about what is going wrong.

If we can link biodiversity to the spiritual aspect, things will change.

Michael Kapo *Papua New Guinea*

In the past we saw spirits in every tree. But now, with Christianity coming in, things are changing. It was easy for we Solomon Islanders to accept Christianity because we believe that God lives everywhere. It was just that we had different names for such things in the past.

God lives on the trees and there are times, if you are close to something like that, you can specifically call a shouting tree or a hunting tree. You can go in and give Him everything in your praise. Whenever you are there, you feel good about things, and as you come home, you stop by a small stream or waterfall and wash.

You learn what trees to take and what not to take for medicines. We believe that you have to go and ask the tree first. If they say yes, you take the medicine, but if they say no, then you do not. They could direct you to another tree which is O.K. to use. You don't take any others.

Ruth Lilongula *Solomon Islands*

When Sibö decided to create the world, the first people he could see were the indigenous people. He visited [illegible] our first ancestors here in Talamanca, and he told them many things. He told them for example, how he made the earth and the sea, how he brought the first animals to the Earth, and how he planted the first trees. He also gave certain laws to us and told us how we will be punished if we fail to obey them. He taught us how we should live with all things on Earth.

He made white people in the day. That is why they are more scientific. He gave them the intelligence to do many things that the indigenous people can't do. White people make cars, planes, bombs, money; they make many things. But Sibö only taught the indigenous people to plant, to raise animals, and to hunt and fish.

The origin of the white people is a relative of Sibö called Pilikakit, which means the King of the Leaf-cutter Ants. Just look at the leaf-cutter ants, how they all work together clearing all the land around their nests. Where the leaf-cutter ants live, all the vegetation is gone because they cut every last leaf and take it back to their big nests.

That is how the white man is. He works very hard, but he destroys nature. The white man cuts down everything that is green, and where he lives there are no trees, no rivers, no animals. On the other hand, the indigenous people don't work so hard. We plant corn, raise animals and live in the forest. We don't like to destroy nature, we like to live in nature.

Juan Vargas, Rodolfo Mayorga, Carmen Leiva, Aníbal Morales, Gloria Mayorga, Juanita Sánchez, Eustacia Palacios, Catalina Morales
Costa Rica

All peoples living like the Saami, linked to nature as reindeer herders, have spiritual contact. We live adoring nature and then it becomes sacred.

There is a necessity to please nature so that it gives to you. You have to be kind to nature so that nature will give you more. You have to be friends with the environment, otherwise it won't work in cooperation with you on whatever you call the spiritual.

Johan Mathis Turi *Saami people, Norway*

All of the things that are here, the waters, plants, forest and wildlife, whatever, are God-given. To put a value on them is difficult. The money-lender would be very little interested. What is equivalent to the bio-diversity here, to the things that surround us, is my life. If you took these things away, it would be like taking part of my life, and then our survival would be questionable.

Pierre Johnston, *people, Belgium*

Frans Mansuara/UNEP/Topham

Excerpted from statements by representatives of indigenous and traditional communities in response to a request from UNEP for information on how they value biodiversity, collected by the Environment Liaison Centre International and published in Cultural and Spiritual Values of Biodiversity, *edited by Darrell Addison Posey (UNEP and Intermediate Technology Publications).*

Cultural and Spiritual Values of Biodiversity *(softback: $56.00; hardback $105.00) is available from: SMI, PO Box 119, Pin Green, Stevenage, Herts SG1 4TP, United Kingdom. Tel: +44 1438 748111; Fax: +44 1438 748844; E-mail: Enquire@smibooks.com*

Millennium massacre

VALMIK THAPAR

I thought I would end this century feasting on the extraordinary recovery of the wild tigers of Ranthambhore Tiger Reserve in the State of Rajasthan and in a way I did. I spent nearly 30 minutes reversing my Jeep some 4 kilometres in the face of a tigress that decided to move from one end of the valley to another, and it was a day to remember as I quietly clicked my camera and loved every minute of it.

But I was rudely awakened on the 19 December to what is happening to the wilderness when, purely by accident, the Sales Tax Inspectors in Ghaziabad – a small town in North India – intercepted a truck and found 50 leopard skins and 3 tiger skins. It was probably the second largest seizure of big cat skins since independence.

Illusory recovery

I went to the town with some of the most senior officers of the Ministry of Environment and Forests. There in front of us were laid out and hanging the skins of so many dead leopards that the first sight took the breath away and stunned all of us into silence. I realized that the recovery of Ranthambhore was probably only an illusion.

How many thousands of mornings I have waited even for the faintest sign of a leopard in India's forest. In over 25 years I have seen 28 of them – and here I was surrounded by 50 dead ones. Some were enormous, their skins shining in the early morning sun. They all looked freshly killed – in the last six months. They had been cured somewhere and waxed and even had the signature of the 'artist' at the back.

I and my colleagues from the Ministry were shocked, even close to tears. But this must be only the tip of the iceberg in the massacre of India's wildlife. Hundreds of leopards and tigers are being decimated by the coordinated efforts of poaching gangs right across India. The 20th century could not have ended on a more ugly note.

Yet the new century opened with an even worse shock. On 12 January 2000 a police party with wildlife inspectors raided three premises in Khaga, Fatehpur in the North Indian State of Uttar Pradesh and seized 70 leopard skins, 4 tiger skins, 221 black buck skins, 18,000 leopard claws and 132 tiger claws.

It appears that the seizures were linked. The three premises were illegal factories that were tanning and curing skins. By 15 January more than 185 kilograms of tiger and leopard bones had been recovered from around them. In all, remains from 1,100 leopards and 35 tigers were found in this one place. What could have been processed at these factories in the last decade? This was clearly the largest seizure ever in the world of big cat derivatives.

We as a conservation community have failed – the Government, the Ministry, the states, the non-governmental organizations and people like myself. We have entered the 21st century with no intelligence, no information – impotent to act. Hardly any mechanism of wildlife governance and enforcement is working. Our laws are being violated with impunity.

Big business has ripped apart the wilderness of India for mining, and illegal traders have picked out our precious wildlife for commerce. None of us has worked out a way to counter either. It is a national shame, an unmitigated disaster that a country like ours has not been able to take on the challenge to save its superb natural heritage.

Global crisis

We are already losing thousands of square kilometres of dense forest each year. We believe that at least $12 billion worth is exploited from India's natural treasury annually. The skin market across the world is booming and the planet is loosing the best of its natural treasures. We have failed globally to act in time – our international organizations are just not strong enough to deal with the crisis that engulfs us.

India's wilderness is heading for disaster. Can we hope for a global political will that brings effective international cooperation? Can we hope that innovative mechanisms for enforcement do not get lost in endless rhetoric and diplomacy? Can we even begin to hope that human beings everywhere will act before it is too late to reverse the horrors that envelop us, not just in India but across the planet? ■

Valmik Thapar, who has spent 25 years following the trail of the wild tiger, is Executive Director of the Ranthambhore Foundation and South Asian Chair of the Cat Specialist Group of IUCN-The World Conservation Union.

Anand Vijay Singh/UNEP/Topham